same rate;" and, "From observations on the small white spots, as well as on dark markings near the equator, it is probable that the matter in the equatorial regions constantly drifts in the direction of the planet's rotation; and it seems probable that the rate of this drift depends on the latitude." The dark spots seen in 1880 far N. of the equator, by many English observers, apparently furnish a negative to this conclusion. It is possible, however, that the small white spots outside the equatorial zone move slower than the dark markings referred to. It is evident that the different velocities of the various spots offer a very complex problem for solution. It may be that though these velocities follow no law dependent upon distance from the equator, they may each be special to the zones in which they occur. Or they may possibly be accounted for on the thesis that the planet is enveloped in a series of dense atmospheric layers or shells, each of which, according to height, manifests a different rate of motion, which becomes revealed either by temporary disruption or partial decadence of the outer envelopes. There is, probably also vast differences of temperature in the various markings observed, and this may originate another element of disturbance. In any case, we may be assured that all the varieties of spots and streaks observed so persistently and numerously upon the planet are the phenomena of his dense atmosphere and not objects of stability upon his actual surface, which seems to be entirely shrouded from our scrutiny by masses of heated vapour which are woven into parallel bands by the effects of a very rapid rotatory movement. The further telescopic study of these remarkable markings cannot fail to prove of considerable interest, and may perhaps lead to the partial elucidation of what now appears to present difficulties beyond explanation.

Bristol: 1883, *Jan.* 11.

Postscript, on a Communication made to the Royal Astronomical Society, in November last, on Stellar Photometry. By Professor C. Pritchard, D.D., F.R.S.

Since my last communication in November 1882, I have had an opportunity of examining another wedge of neutral-tinted glass constructed for Mr. Knott by Mr. Hilger. It has been scrupulously measured by the same photometrical process as that described in my paper already referred to. The instrument I find to be practically uniform in its action throughout its extent of 6 inches in length, but I have also furnished Mr. Knott with a table, theoretically exact, by means of which, from simple inspection, he may be able to reduce the graduated indications of the wedge to the difference of the magnitudes of any star whose light is just extinguished by the instrument. I need scarcely repeat that, although on different nights, the same star will be

extinguished at very perceptibly different parts of the wedge, the intervals of length between the points of extinction of the lights of two stars will be found to be sensibly the same on different nights. After the application of this photometer to many thousand measures, I can hardly conceive any photometrical process more simple either in the way of observation or in the subsequent reduction of the observations.

If this were all that I have to say on the subject, I should not be justified in at present occupying the valuable time of the Society's meeting. But in measuring photometrically Mr. Knott's wedge, I took the opportunity of still further testing its capacity, in respect of its capability of measuring the relative intensity of light of *different colours*.

I had already established the fact that the same thickness of wedge reduces the ratio of the incident and emergent lights in the same degree, whatever may be the colour of the light. But it seemed to me to be desirable to inquire further, whether two equal lights of two different colours would be extinguished at the same point of the wedge. This experiment seemed crucial as to the applicability of the photometer to stars of different colours, and especially of double stars of this description. Accordingly, I arranged an apparatus, consisting of a rhomb of calcspar, a uniform plate of selenite, and a Nicol prism, and in this way I obtained two coloured images of a small rectangular aperture illuminated with white light from the sky, the apparatus being so arranged that the two coloured images must possess theoretically the same intensity. The two coloured lights—in this instance, yellow and its complementary green—were extinguished at practically the same point of the wedge. This experiment, which was verified by no less than four experienced observers, appears to establish the applicability of the instrument to stellar photometry irrespective of the colours of individual stars. In this inquiry I was greatly assisted by the experience and personal aid of H. B. Dixon, Esq., of Trinity College, whose photometrical researches while Secretary to a Royal Commission on the subject of standard candles and the quality of illumination by coal gas, are well known.

Notwithstanding the theoretical equality of the two complementary coloured lights, to the unaided eye of all the observers the yellow light appeared to be the brighter of the two lights: probably the yellow light would have been estimated at half a magnitude brighter than the green; and this fact, I think, explains the circumstance that Prof. Pickering's measures of the relative magnitude of the two components of β *Cygni* assign a greater degree of brightness to the larger yellow component compared with that of the smaller and blue component than is assigned to it in the Oxford photometry. The measures of relative brilliancy of the two components give the following results (*Monthly Notices*, vol. xliii. p. 5):—

Harvard College, diff. of magnitude		2·14
Oxford	,,	1·74
Oxford repeated (Nov. 6)	,,	1·82

Having reason to place great reliance on Professor Pickering's photometry, I directed the re-observation of the stars. The result (given above) confirmed the Oxford measure, and nothing remained for me but to agree to differ from the Harvard result. I think the trifling discrepancy, for after all it is but trifling, admits now of a very satisfactory explanation. The Harvard photometer is on the principle of applying the judgment of the eye to the equality of light; the Oxford method relies on the judgment of the eye as to the point of extinction of a light. Each is valuable in its way, but as at present advised (and with special reference to the experiment just mentioned) I am inclined to place a greater reliance on the latter method in the case of photometry of double stars of *different* colours.

I will close this note by stating that the photometry of the brighter stars from the Pole to the Equator is now completed, and that before the reading of this note to the Society I shall be on my way to Cairo for the purpose of instituting some inquiries respecting the atmospheric and climatic effects on the absolute brilliancy of stars, which appear to me to be essential to the completion of this photometric research.

Reduction of Latitude and Logarithm of the Earth's Radius with Col. Clarke's Value of the Earth's Compression. By E. J. Stone, M.A., F.R.S.

The semi-diameters of the spheroid, which best represents the Earth's surface, determined by Col. Clarke, differ considerably from those found by Airy and Bessel.

The following are the results for the Equatorial and Polar semi-diameters expressed in English feet :—

		a	b	$a : b$
Airy	...	20923713	20853810	299·33 : 298·33
Bessel	...	20923600	20853656	299·15 : 298·15
Clarke	...	20926202	20854895	293·465 : 292·465

The two first results agree in a very remarkable manner; but to a great extent they were deduced from a discussion of the same data.

A large mass of observations, bearing on the question of the figure of the Earth, have recently been made available, and Col. Clarke has attacked the question with far more extensive materials than were available to Airy or Bessel in their discussions. I presume therefore we must accept Col. Clarke's